A·R·S SCIENCE HALL ·OF· FAME

June 9, 1992

Agricultural Research Service
United States Department of Agriculture

1986
Edward F. Knipling

1987
Howard L. Bachrach
Myron K. Brakke
Glenn W. Burton
Wilson A. Reeves
Ernest R. Sears
Orville A. Vogel
Cecil H. Wadleigh

1988
Francis E. Clark
Edgar E. Hartwig
Ralph Edward Hodgson
Hamish N. Munro
Jose Vicente-Chandler

1989
Douglas R. Dewey
Theodor O. Diener
Karl Norris
John F. Sullivan

1990
Theodore C. Byerly
Gordon Edwin Dickerson
Robert W. Holley
Virgil A. Johnson
George F. Sprague

1991
John H. Weinberger
Walter H. Wischmeier

The Agricultural Research Service Science Hall of Fame

The ARS Science Hall of Fame was inaugurated in 1986. We determined that each succeeding year, one or more present or former scientists with the Agricultural Research Service could be selected, subject to the following criteria:

- The selectee's research must have contributed significantly to the solution of a major agricultural problem and reflect credit on the Agricultural Research Service.

- The selectee is recognized nationally and internationally by his or her peers in the scientific community.

- The selectee's character and record of achievement is worthy of emulation by younger agricultural scientists.

- The selectee must be either retired or eligible to retire and must continue to be professionally active.

Today we honor several outstanding scientists by inducting them into the Science Hall of Fame. A plaque citing the achievements of each will be on permanent display in the ARS National Visitor Center at the Beltsville Agricultural Research Center.

R. Dean Plowman
Administrator

June 9, 1992

1992

Raymond C. Bushland
Research Entomologist (retired)
Screwworm Research Laboratory
Mission, Texas

For pioneering research leading to screwworm eradication by the sterile insect technique and for research leading to control of typhus vectors.

Raymond C. Bushland helped Dr. E.F. Knipling (the first member of the ARS Science Hall of Fame) develop his theory of using mass-reared sterile insects to overwhelm the wild population. Dr. Bushland's work was instrumental in making the theory practicable: He developed an inexpensive diet for mass-rearing screwworm larvae, and he demonstrated in laboratory and field tests that exposure to x-rays or gamma rays could render screwworm flies sterile without significant diminution of their vigor and mating behavior and that releasing the sterilized flies into a natural population could eradicate that population.

The success of these experiments, inspired by Dr. Knipling's theoretical model, led to screwworm suppression programs in the Southeastern United States in 1958 and in the Southwest in 1962. The program in the Southeast resulted in eradication of this isolated population in about 18 months. In later years, the United States joined with Mexico to eradicate screwworms over a broad multinational region. These eradication programs have already saved the livestock industries, and ultimately consumers, billions of dollars. Dr. Bushland's basic research and leadership, together with the technical advice he gave to the program managers and livestock producers, were key factors in the success of the eradication programs. In 1991, the United Nations awarded Drs. Knipling and Bushland the FAO Medal for Science in Agriculture as the inventors of the sterile insect technique for screwworm eradication.

Dr. Bushland has received many honors in addition to the FAO Medal, including the USA Typhus Commission Medal in 1944 (for wartime research on controlling vectors of typhus) and the Entomological Society of America's Founders Memorial Award in 1972. He retired in 1974, but he continues to work as a collaborator with ARS and the USDA Animal and Plant Health Inspection Service, and he is a trustee of the Southwest Animal Health Research Foundation.

1992

Lyman B. Crittenden
Research Leader (retired)
Avian Disease and Oncology Laboratory
East Lansing, Michigan

For significant contributions to retroviral genetics, transgenic animal development, and genome mapping in poultry.

Lyman B. Crittenden led a 10-year group effort that developed improved methods for detecting and reducing the effects of avian leukosis virus in poultry. He then led a program that resulted in development of the first transgenic chickens. These chickens were genetically engineered to prevent infection by certain strains of the avian leukosis virus. He also designed and established a new nationally coordinated program to map the chicken genome

Dr. Crittenden's distinguished career in poultry genetics and virology has been an immeasurable service to poultry science, the poultry industry, and the consumer. Among his many other accomplishments, he led the group that first showed that cellular resistance to Rous sarcoma virus was controlled by recessive genes that control virus penetration of the cell. He identified genetic loci that controlled resistance to four subgroups of Rous sarcoma virus. And he was the first to recognize and publish the principle that genetic resistance to lymphoid leukosis involves both resistance to virus infection and resistance to tumor development. He was also the first to demonstrate that production of a complete endogenous avian leukosis virus is controlled by a single dominant gene.

Among the many other honors that Dr. Crittenden has received during his career are the Merck Award for Outstanding Achievement in Poultry Science presented by the Poultry Science Association in 1980, the Tom Newman International Award presented by the British Poultry Hatchery Association in 1983, and ARS Distinguished Scientist of the Year in 1985. Dr. Crittenden retired from ARS in 1989 and is currently on the faculty of Michigan State University, where he continues to lead the joint ARS-MSU project on mapping the chicken genome that he began in his final years with ARS.

1992

Arnel R. Hallauer
Research Leader (retired)
Field Crops Research Unit
Ames, Iowa

For increasing understanding and use of quantitative genetics in plant breeding, which has led to development of many superior corn hybrids worldwide.

Arnel R. Hallauer had a leading or supportive role in the development and evaluation of more than 30 maize synthetics and 18 inbred lines that were released to the seed industry during his years as leader of the ARS maize-breeding research project. A 1980 survey showed that 42 percent of hybrid corn planted in the United States had germplasm from his program and that inbred B73 was used more extensively than any other inbred line in production of U.S. hybrids. B73 is also used as a parental line for hybrids grown in several European countries and in Asia.

Dr. Hallauer's application of quantitative genetics to development of germplasm populations, inbred lines, and maize hybrids has been equally significant. He developed and tested the reciprocal full-sib selection method to combine recurrent selection procedures for population improvement with inbred and hybrid development. His work culminated in the book "Quantitative Genetics" in Maize Breeding, published in 1981, which has been so widely used that the first edition went through four printings.

He has also been active in the training of graduate students, having directed 34 completed Ph.D.'s and 17 completed Master's in plant breeding; almost two-thirds of these students were from developing countries.

Dr. Hallauer is a member of the National Academy of Sciences and during his career has received many other honors, including the 1990 Crop Science Society of America's DeKalb-Pfizer Distinguished Career Award and the Agronomic Achievement Award of the American Society of Agronomy in 1989. Though retired from ARS in 1989, Dr. Hallauer remains active in teaching at Iowa State University where he is also directing three Master's and eight Ph.D. candidates.